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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,422	12/12/2003	Bing Shen	139805	1421
23413 7590 03/14/2007 CANTOR COLBURN, LLP 55 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002			EXAMINER HO, ALLEN C	
			ART UNIT	PAPER NUMBER
			2882	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/14/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/707,422	SHEN ET AL.	
	Examiner	Art Unit	
	Allen C. Ho	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-12,16-20,24-28 and 30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,5-12,16-19,24,25,27,28 and 30 is/are allowed.
- 6) ☒ Claim(s) 20 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 20 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gard *et al.* (U. S. Patent No. 5,131,021) in view of Sasaki *et al.* (U. S. Patent No. 6,411,672 B1) and Ooi (U. S. Patent No. 6,014,420).

With regard to claim 20, Gard *et al.* disclosed an imaging system that comprises: an x-ray source (10) that produces an x-ray beam (22) and has a focal spot (26); a detector array (14) that receives the x-ray beam and includes a focal spot sensing device (18), the focal spot sensing device includes at least two detector elements (18', 18'') arranged next to each other so that the x-ray beam strikes more than one of the at least two detector elements, but only a portion of each, the portion being less than 100% of a sensitive area of an associated detector element (column 5, line 60 - column 6, line 33); wherein a change in output signal of each detector element of the sensor device is responsive to a change in position and size of the area of x-ray allowed to fall on each detector element of the sensor device in response to the movement of the focal spot (column 6, line 34 - column 7, line 66); and wherein the change in the output signal is a position indicator for the focal spot.

However, Gard *et al.* failed to disclose that the focal spot sensing device is disposed in a housing with an opening. Furthermore, Gard *et al.* disclosed two focal spot sensing devices disposed at two edges of the detector array, instead of one focal spot sensing device disposed at only one edge of the detector array.

Sasaki *et al.* disclosed a CT detector (25) disposed in a housing (17). The housing comprises an opening (16) that allows an x-ray beam to enter the housing. Furthermore, the housing comprises temperature-controlling means to make the temperature of the CT detector uniform. Sasaki *et al.* taught that temperature non-uniformity in the detector elements causes artifacts in a CT image (column 1, lines 32-50).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to dispose the detector array including the focal spot sensing device in a housing as disclosed by Sasaki *et al.* First, a person would be motivated to protect the detector array. Second, a person would be motivated to provide a means to mount the detector array to the rotating gantry of a CT. And third, a person would be motivated to obtain a CT image without artifacts by reducing temperature non-uniformity in the detector elements.

Ooi disclosed an imaging system that comprises a detector array (3) including a focal spot sensing device (3b), wherein the focal spot sensing device is disposed at only one edge of the detector array. Furthermore, Gard *et al.* taught that one focal spot sensing device is sufficient to determine a position of the focal spot. Specifically, Gard *et al.* utilized only one focal spot sensing device disposed at only one edge of the detector array to determine a difference signal (Eq. 6). Gard *et al.* never explained how to make use of signals derived from two focal spot

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sensing devices disposed at both edges of the detector array, which renders this particular embodiment inoperative.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a focal spot sensing device at only one edge of the detector array, since a person would be motivated to determine a position of the focal spot according to the teaching of Gard *et al.*

With regard to claim 26, Gard *et al.*, Sasaki *et al.*, and Ooi disclosed the system of claim 20, further comprises a control mechanism (120).

Allowable Subject Matter

3. Claims 1, 5-12, 16-19, 24, 25, 27, 28, and 30 are allowed.
4. The following is a statement of reasons for the indication of allowable subject matter:

With regard to claims 1 and 5, the prior art fails to disclose a focal spot sensing device that comprises: a sensor device that includes at least three detector elements, wherein a first and a second of the at least three detector elements are arranged next to each other and are aligned with a first axis parallel to the plane of the sensor device, and the first and a third of the at least three detector elements are arranged next to each other and are aligned with a second axis parallel to the plane of the sensor device, the second axis being perpendicular to the first axis as claimed.

With regard to claims 6-11, the prior art fails to disclose a focal spot sensing device that comprises an opening dimensioned to be approximately a pinhole as claimed.

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With regard to claims 12 and 16-19, the prior art fails to disclose a focal spot sensing device that comprises: a first means for calculating and a second means for calculating, each includes at least two detector elements arranged next to each other, wherein the first means for calculating is aligned with a first axis, the second means for calculating is aligned with a second axis, the first axis being perpendicular to the second axis as claimed.

With regard to claims 24 and 25, the prior art fails to disclose an imaging system that comprises an opening dimensioned to be approximately a pinhole as claimed.

With regard to claims 27, 28, and 30, the prior art fails to disclose a method for sensing a focal spot, the method comprises: receiving the x-ray beam at the sensor device disposed in the focal spot sensing device, wherein the sensor device includes at least three detector elements arranged on two orthogonal axes such that the x-ray beam passing through the opening is allowed to strike more than two of the at least three detector elements, but only a portion of each, the portion being less than 100% of a sensitive area of an associated detector element; and calculating a position in two dimensions of the focal spot in response to an area of the x-ray beam allowed to fall on the sensor device changing in both position and size at the sensor device in response to movement of the focal spot in a plane parallel to the plane of the sensor device as claimed.

Response to Amendment

5. Applicant's amendments filed 21 February 2007 with respect to claims 12 and 16-19 have been fully considered and are persuasive. The rejection of claims 12 and 16-19 under 35 U.S.C. 112, second paragraph, has been withdrawn.

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6. Applicant's amendments filed 21 February 2007 with respect to claims 1, 5, 6, 8-12, 16-19, 27, 28, and 30 have been fully considered and are persuasive. The rejection of claims 1, 5, 6, 8-12, 16-19, 27, 28, and 30 has been withdrawn.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

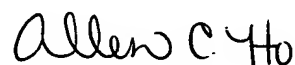
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 9:00 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Allen C. Ho, Ph.D.
Primary Examiner
Art Unit 2882

08 March 2007